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A Heuristic Approach to Interdisciplinary Theory Development: Nurturing A Renaissance in Strategic Management

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Abstract

Empirical studies on collectives of firms (cognitive communities, cooperative and competitive networks, strategic groups) reveal that different theoretical perspectives converge in stable industries (Scottish knitwear, UK grocery retailing) but diverge in ambiguous, turbulent industries (US computer software). Ironically, the ambiguity that may create a demand for theories may also create the conditions under which the theoretical perspectives (e.g., psychology, organizational behavior, economics) provide the most divergent sets of results. Consequently, general managers may be hard pressed to develop a comprehensive strategy based on reports submitted from a variety of departments by analysts trained in different areas. With this in mind, a theoretical framework is proposed as part of a stream of interdisciplinary research. Analytic models developed within this synthesis process may improve techniques for forecasting industry dynamics, especially in oligopolies and highly turbulent environments. This may help practitioners cope with the kinds of rapid changes that are coursing through the business world today.

A Heuristic Approach to Interdisciplinary Theory Development: Nurturing A Renaissance in Strategic Management

Today's managers are faced with a world that is rapidly changing. Many firms are undergoing structural metamorphoses to better fit the demands of post-industrial environments. Structural changes are simultaneously occurring at more macro levels. Throughout Europe, many long-standing political and economic boundaries are rapidly changing. Events such as these demand a rebirth and revitalization of managerial thought.

As the business world undergoes a renaissance, the academic world may be forced to undergo a renaissance of its own. Researchers may draw on a number of paradigms to study strategic management in these turbulent times. For example, psychology may provide insights into the rational and emotional aspects of decision-making for individuals faced with ambiguity and change. Organizational behavior may cast some light on interactions among individuals within and between firms as modes of organizing shift. Industrial-organization (I-O) economics may generate implications for interactions among firms as the structure of industries change.

Each perspective may capture a part of a given strategic management phenomena, but like the parable of three blind men feeling an elephant, an integrated understanding is rarely obtained. To understand the implications of such dramatic changes occurring at so many different levels, researchers may find it necessary to tear down some of their own boundaries or run the risk of overlooking some of the critical forces for change.

To date, there has been little progress in synthesizing the diverse theories used in strategic management research into one coherent theoretical perspective. The primary difficulties stem from incompatible assumptions, differences in units of analysis, etc. There have been calls for a multilectic approach in which (partially) incommensurate theoretical perspectives are juxtaposed. However, it may not be sufficient to suggest that different perspectives provide different insights without integrating those findings. Huff (1981, p. 87) argues that "the culture clash between genuinely different points of view can be an important basis for the development of knowledge."

Such theory-driven clashes can stimulate creative thinking. This may lead to the extension of existing theories or the development new ones.

However, the integration of the accumulated knowledge need not be theory-driven. Expanding on the parable of the three blind men feeling an elephant, the men may be unable to integrate their findings if they (a) separately develop theories based on unique subsets of data, and then (b) share their theories. An alternative would be to (a) systematically combine their raw data, and then (b) develop theories based more complete information.

In empirical sciences, theories generally represent abstractions of accumulated data. As such, they tend to be more compact and less cumbersome to deal with than the underlying body of data. However, a set of data may be interpreted in more than one way, and the abstraction process in theory development may induce pronounced biases into the accumulating body of knowledge. This suggests an efficiency-effectiveness trade-off. Relative to operating on raw data, manipulating abstractions of the data (theories) may increase the efficiency of integration attempts by reducing the number of elements considered. However, using those abstractions may reduce the effectiveness of integration attempts by accepting an unknown degree of bias in each body of knowledge. A heuristic for managing this trade-off, given that the degree of bias is unknown, would be to focus first on the highest level of abstracted information in each field. This would reduce the number of elements considered. If a synthesis is not be readily forthcoming at the highest levels of abstraction (theories), successively lower levels of abstraction could be considered. While a relatively data-driven approach may generally be less efficient, it may be more effective than a more theory-driven approach in some cases.¹

In strategic management, a purely theory-driven synthesis of knowledge from related fields seems implausible. In the spirit of an academic renaissance, this paper is intended to nurture a rebirth of theory development from a marriage of empirical findings from several fields. A heuristic

¹This is not to imply that data are free of bias. It is assumed that interpretation of data introduces more sources of potential bias. It is possible that the new sources of bias may offset existing biases in the data. Alternatively, the degree of bias may increase as independent sources of bias are added and/or interactions among biases are generated.

approach to interdisciplinary theory development is illustrated via a discussion of different perspectives on collectives of firms. First, collectives within industries are considered from three theoretical perspectives. Then, empirical findings from a series of studies are systematically examined to develop a more holistic understanding of collectives of firms within industries. This heuristic approach is expanded to address a broader scope of issues in strategic management. A framework is provided as a blueprint for the synthesis of the bodies of knowledge accumulated in fields related to strategic management. Finally, ongoing streams of research are outlined.

An Example Based on Collectives of Firms

The first step in this illustrative example is to address the relatively abstract contributions from each field. A number of theoretical constructs have been used to describe collectives of firms within industries. Cognitive communities emphasize issues from psychology, strategic groups reflect issues from I-O economics, and networks of interacting firms reflect issues from organizational behavior and organizational theory. In this section, definitions of these constructs are proposed, and the overlap of these definitions is discussed.

Cognitive Communities

Economic incentives have been used to explain a wide range of phenomena. However, managers operate under bounded rationality. They are influenced by economic incentives, but only indirectly through their perceptions of those incentives. If a manager does not perceive an economic incentive, that incentive will have no influence on the manager's choices regarding either actions inside her firm or transactions with other firms.

Managers are motivated to make accurate assessments of the opportunities and threats in the environment as well as the strengths and weaknesses of the firm. In this sense-making process, cognitive structures such as taxonomies of firms and causal maps are used to link strategic actions to performance. In this way, managers are drawn toward economically rational decisions, but imperfectly so. The situation is complicated further in that managers do not act in a vacuum. Each

manager is surrounded by others who are equally unable to flawlessly perceive "economic reality" (although some of them would not admit it, not even to themselves).

The relative profitability of various patterns of interactions are learned (a) directly through trial and error, (b) vicariously through observation, and (c) through instruction via word of mouth, trade publications, industry observers, etc. Applying a population ecology view of the survival a dispersion of ideas throughout the niche, beliefs that approximate the economic reality of the industry will survive longer and disperse more widely than less accurate beliefs. Ultimately, the less accurate beliefs will be forced out as the more accurate beliefs diffuse among actors and become widely shared.²

Cognitive maps are essentially informal theories; those that best explain observed events in an industry are retained, while those that accumulate a large number of anomalous observations tend to be discarded (Kuhn, 1962). This process results in a socially constructed understanding of what works in that industry. Those sharing the resulting set of beliefs constitute a cognitive community (Porac and Thomas, 1990; Porac, Thomas, and Baden-Fuller, 1989). The consensual set of beliefs make up the norms or recipés for doing business in that industry.

Two definitions of cognitive communities are proposed. The weak definition is based solely on similarity of cognitive structures (e.g., taxonomies of rivals, causal map); the strong definition additionally requires active interactions, mutual influence, and collective cognitive efforts.

Under the strong definition, it is conceivable that the cognitive community could collectively extend the boundaries of rationality by pooling existing information and cognitive resources. The Japanese approach to developing a fifth generation computer illustrates the potential power that collective action can have in solving complex problems.

Rather than directing the pooled efforts toward a particular technological challenge, members of a cognitive community may direct their efforts toward solving specific strategic

²Escalating commitment and other psychological factors may motivate some managers to push ideas in spite of failures (at least temporarily).

management issues and finding optimal patterns of transactions. For example, members of a cognitive community might jointly identify a cooperative pattern of interactions that yields satisfactory profits for all its members without a negative impact on social welfare. Identifying such win-win solutions is often quite difficult. Intuitively, such solutions might be easier to identify if the parties pool their resources rather than try separately to identify a solution that the other members would accept. Due to information impactedness (Williamson, 1975), some problems seem to require a coordinated effort to get a solution.

Strategic Groups

Strategic groups represent a view of collectives with a greater emphasis on economic issues. As noted in the discussion of cognitive communities, managers of firms observe rival firms to gain information about what works in the environment (Porac, Thomas, and Baden-Fuller, 1989). In other words, managers, acting like brokers, learn about the socio-political constraints associated with various subnetworks by observing successful agreements among other collectives (e.g., rivals and consumers). If a rival firm positions itself in an extraordinarily profitable niche, some of its competitors will be tempted to follow it (Scherer, 1980; Tirole, 1988). As a result of this process, firms are expected to converge on the strategic positions that yield the highest levels of performance.³

As new firms enter a niche, demand is divided among more competitors. Hence incumbent firms experience a decline in their respective market shares, and subsequent entrants tend to gain smaller portions of the market (Scherer, 1980; Tirole, 1988). "This process should continue until the opportunities for making a supranormal profit have been exhausted" (Scherer, 1980). Mobility barriers (Caves and Porter, 1977; Fiegenbaum and Thomas, 1987; Tirole, 1988; Caves and

³For the sake of readability and coherency throughout the paper as a whole, it will be assumed that firms have not diversified and that they function as single business units. The logic can be extended to diversified firms by substituting "strategic business units (SBUs)" for "firms". Multiple point competition among conglomerates would be more complex, but quite appropriate given the systems approach to overlapping networks proposed in this text.

Ghemawat, 1989) and uncertain imitability (Lippman and Rumelt, 1982) lower the economic incentives for potential entrants and help to preserve economic incentives for incumbents.

Firms seek the most profitable niches that they can successfully defend. The firms with the best fit to environmental demands get the lion's share of the profits. The weaker firms (i.e., those ill-fitted to the environment) are left to scramble for footholds in the less attractive niches. This process tends to bunch firms together in a number of profitable niches. These naturally occurring bundles of firms have been labeled strategic groups (Porter, 1980; McGee and Thomas, 1986).

A weak definition of strategic groups could be based on similarity of asset configurations either as a means of operationalizing firms within similar niches or firms with similar resources (McGee and Thomas, 1986). Explicit in the structure-conduct-performance paradigm of I-O economics is that firms in the same niche will follow the same strategy because they are influenced by the same external forces. That is, firms within a group would be expected to react the same way to events in their environment. This I-O economics view focuses on the environmental forces outside of the firm.

A resource-based view of the firm (Penrose, 1959) is more inward-looking and adopts a focus on economics at the firm level. In a resource-based view, strategic groups are clusters of firms with similar resources and core competences, and it is assumed that firms with similar strengths and weaknesses are likely to act in similar ways. While the focus of the I-O economics approach differs from that of the resource-based view, the implications are the same. Firms within strategic groups are expected to behave in similar ways. This is assumed to be true even if each firm is acting independently: collusion is not necessary for firms to act in parallel.

Implicit in the term "strategic group" is that the firms in a given group are pursuing a common strategy. That is, the managers direct the decision-making processes and the subsequent actions of the firm based on similar goals and beliefs about how to obtain those goals. Adopting a cognitive/decision-making orientation, a semi-strong definition of strategic groups adds a constraint to the weak definition by also requiring sets of firms to be similar in terms of goals and

beliefs (i.e., similar cognitive structures). This added requirement would avoid grouping firms that have acquired similar resources but for different reasons.

A strong definition of strategic groups adds one more constraint to the semi-strong definition. In addition to (a) similarity with regard to resources and (b) similarity with regard to goals and beliefs, the strong definition also requires (c) interdependence and interaction among firms within a group. This additional criteria counters the criticism that strategic groups are merely statistically defined, artificially imposed categories. To be considered a strategic group, a set of firms would have to operate as an interacting, ongoing collective.

Firms sharing a common niche may have conflicts with respect to inputs (e.g., transactions with suppliers), throughputs (e.g., labor, equipment), and/or outputs (e.g., distribution channels, direct transactions with consumers). The actions of Firm-A could affect the profitability of Firm-B, and vice versa. Multipoint, cut-throat competition would tend to reduce profits of all the firms in the niche, while cooperative (collusive) behavior would allow firms to take greater profits (with monopoly rents as an upper bound) (Scherer, 1980). This interdependence can be viewed as a mixed motive game in that there are, simultaneously, incentives to cooperate and compete with rival firms. Typically, a mixture of cooperation and competition evolves. However, as interdependence becomes more defused (e.g., firms can not effectively punish specific rivals), the degree of competition will tend to increase. Porter (1980) suggests that this type of interdependence among firms is the essence of oligopoly.

Cooperation may be relatively passive. For instance, firms may simply agree not to compete on a particular strategic dimension such as price or quantity of output. This is the notion of tacit collusion in oligopoly theory. A more active form of cooperation might involve collective strategies involving coordinated, joint actions. Cooperation may be aimed at achieving a common goal. For example, pharmaceutical firms could potentially join efforts toward finding effective treatments for AIDS. Alternatively, actions could be directed toward rival firms outside of the group. For example, erecting mobility barriers for the group could reflect collective efforts in a

defensive posture. Collective advertising designed to increase the joint market share of the group relative to the rest of the industry would illustrate a more offensive stance.

While firms within the group may have to compromise with other members of the group when forming a collective strategy, the process may broaden their options overall. By supplementing and/or complementing each others assets, a collective may compete in ways that none of its member firms could (Penrose, 1959). This may include attempts to manipulate (enact) industry structure.

From a strategic management point of view, this joint action is perhaps the most intriguing aspect of strategic-groups. The weak and semi-strong definitions of strategic groups suggest that firms within groups will have parallel reactions to environmental change. This helps to simplify industry analyses for strategic planning purposes (Porter, 1980). In contrast, the strong definition of strategic groups as networks of interacting firms enriches industry analyses by considering more sophisticated forms of strategic behavior such as collective strategy (Astley, 1984; Bresser and Harl, 1986; Nielsen, 1988; Fombrun and Zajac, 1987). It is unfortunate that such networks of interactions are generally ignored when operationalizing the strategic-group construct.

Networks of Interactions Within and Among Firms

The third theoretical perspective on collectives of firms within industries is adopted from organizational behavior and organizational theory. Firms are relatively formal systems of interacting individuals. They represent hierarchical nexuses of relatively long-term contracts (Eisenhardt, 1985). Given that firms are embedded in larger systems such as industries, the hierarchical nesting can be extended beyond the boundaries of firms (Jemison, 1981; Frombrun, 1986). In addition to being hierarchically nested, these networks of individuals may be partially overlapping within and across levels of the hierarchy. For example, individuals may interact within networks constituting (a) firms, (b) professional interest groups, (c) unions, (d) families,

etc. These networks may overlap any number of times and the nature of relationships between any two individuals may be extremely complex.⁴

Each individual belongs to an idiosyncratic set of networks, and therefore, may be viewed as an agent who answers to an idiosyncratic set of principals. Each individual has a personal agenda that stems from the contingencies imposed by the relevant principals.

The concept of a firm represents a cognitive (and legal) simplification that facilitates perceptions of actors and actions (March and Simon, 1958). While it is often expedient to talk about a "firm's response" to events in its environment, focusing on the firm may oversimplify certain problems (Penrose, 1959). Consider March and Simon's (1958) argument that a price mechanism and profit maximization goals for the separate parts of a production process could be used to predict firm behavior. These predictions should parallel those made when examining the firm as a whole. That is, macro-level maximization follows (more or less) from micro-level maximization if the criterion used at the micro level are appropriate. This is the notion of the invisible hand. Under these conditions it is not necessary to analyze the component parts of the firm; the solution set obtained by decomposing the firm into individuals and that obtained by considering the firm as a whole are isomorphic.

However, if (a) the profit maximizing goal is replaced with a satisficing goal and (b) pricing mechanisms are based on imperfect factor markets, it is not certain that the behavior of individuals and coalitions will result in optimal patterns of behavior for the firm or for social welfare. The invisible hand could waiver. Therefore, to predict the interactions among firms, it may be necessary to consider each firm as a network of individuals and examine the intersections of those networks.

Networks within firms. Williamson (1975) proposes that individuals cooperate to form peer groups or hierarchies in order to mitigate the impact of bounded rationality and to reduce their transactions costs. More generally, individuals enter into groups and organizations to obtain

⁴This is the concept of "multiplexity" in network analysis.

personal benefits that they could not readily obtain on their own (Penrose, 1959; March & Simon, 1958; Axelrod, 1984).

Networks may emerge and evolve without formal planning or design. Participants may be muddling through without consensually held ideals or common goals. On the other hand, networks could be developed intentionally. To enact a vision of a market, an entrepreneur could identify potential participants and convince a sufficient number of them that the interactions would be profitable with an acceptable level of risk. In addition to economic incentives, there may be a broad range of reasons for interacting within a network (e.g., personal interests, charitable/ethical considerations, image). A shrewd entrepreneur will often emphasize the idiosyncratic set of non-economic incentives that are salient for a given participant and use these as bargaining chips to reduce the level of economic incentives necessary to induce participation.

This suggests that routines (and the complex social systems they are embedded in) can vary in cost. The most efficient routines are self-reinforcing and, therefore, self-perpetuating. To sustain less efficient routines, the firm might have to pump in resources to reward past participation and maintain satisfactory expectations regarding payoffs for future participation.

According to March and Simon (1958), the survival of the firm depends on how much it costs to run the routines relative to the price that the consumer is willing to pay for the product or service. If the price is at least as great as the cost, then the participants can receive the expected level of rents. The routines will continue to fire as expected until the perceptions of the payoffs change.

If the expected utility of performing a part of the routine drops below aspiration levels, and/or a superior alternative is perceived (Thibaut & Kelley, 1959), some participants might withhold or redirect some or all of the resources they would otherwise contribute to the routine. This shirking may reduce the efficiency and effectiveness of the routine. Consequently, co-workers who depend on that routine may receive personal rents below their aspirations.

To pressure the shirking member to cooperate, co-workers might exploit patterns of resource dependence in a variety of the partially overlapping networks that linking them to the

shirking individual. Alternatively, if there are no incentives for co-workers to coerce shirking members and if co-workers perceive that their pay-offs will be the same whether they personally work hard or shirk, then the co-workers might also decide to shirk. A degenerative chain reaction of this nature could spread throughout the network resulting in a marked drop in performance for the routine as a whole. Consequently, the network in which the routine is embedded may receive lower payoffs as a whole, thereby reducing the allocations to the participants. If payoffs to participants drops below satisfactory levels and superior alternatives are present, some individuals may be motivated to leave (Hirschman, 1970; Thibaut and Kelley, 1959). Eventually, the routine and the network in which it is embedded may fail or, more descriptively, dissolve.

While predictions based on individual-level and firm-level analyses may differ under certain conditions, the processes involved at each level may be quite similar. March and Simon (1958, p. 131) state,

Many of the phenomena of intergroup conflict within organizations are almost indistinguishable from the phenomena that we might consider under the present heading [interorganizational conflict]. The distinction between internal and external relations for an organization is frequently a cloudy one.

In a similar vein, Hennart (1991) argues that the distinction between firms and markets is a matter of relative emphasis. Firms emphasize behavioral controls; markets emphasize price controls. There are few pure forms. By far, the majority of institutions have a mix of behavioral and price controls. By considering both forms of control it should be possible to move smoothly from predictions within firms to those between firms.

Networks between firms. Managers may be viewed as brokers who set up and manage macro-level routines embedded in macro-level networks.⁵ Agency problems are clearly an issue: managers may select and manage routines and networks based on anticipated personal rents (Levinthal, 1988; Eisenhardt, 1989). Managers may not be motivated to optimize the rents for

⁵The term "macro-level" is used in a relative sense. It merely suggests that routines and networks may be decomposed into smaller routines and networks. As such, the discussion may apply to intra-firm and/or inter-firm issues.

networks at either the micro-level or the macro-level. That is, by pursuing personal agendas, managers may not act in the best interest of either their firms or the market as a whole.

As managers negotiate and renegotiate the terms of interactions, subsets of managers (acting as brokers among firms) reach equilibrium points such that the terms of interactions will not change significantly as a result of further interactions and/or renegotiations. If the equilibrium reached in a given network is not satisfying for all of the participants (i.e., firms represented by managers), some participants may withdraw from that network and seek transactions in another network (Hirschman, 1970; Thibaut and Kelley, 1959). The withdrawal of these participants may cause gaps in the value chains. If these gaps can not be filled, the entire network may dissolve.

Eventually some networks that are satisfying for all of its participants will form. Actors within these networks will tend to stay within the network. Further, participants may work to preserve the network (e.g., offer additional economic incentives to retain critical members), thereby preserving their own source of rents. While an equilibrium may exist within the network, disequilibrium may exist between networks and within the larger embedding network as a whole (e.g., an industry, a value chain). Therefore, the term bounded equilibrium will be used to describe the stable state of such networks. It is assumed that managers satisfice. Hence, once a satisfactory state is obtained, there will be little motivation for managers (acting as brokers) to search for alternative transactions.

Stable networks are functional in that they can enable collectives (e.g., strategic groups, cognitive communities) to achieve goals that could not be achieved by the participants separately. Yet there may be an optimal level of robustness in such bounded equilibria beyond which the network becomes insensitive to environmental signals for change. The slow response of the US automotive industry to pronounced changes in its environment illustrates how an overly robust bounded equilibrium may be bad for business.

The view of business as multiplex patterns of exchange within fluid, hierarchical collectives is consistent with phenomena such as joint ventures, equity sharing, mergers, etc. (Pfeffer and Nowak, 1976; Harrigan, 1988; Lyles, 1988). This network approach can be extended to address

phenomena among even larger networks. Individuals acting as brokers may create and manage cartels to limit competition or fix prices. OPEC exemplifies the power that such alliances can generate. The North American Free Trade Agreement and the European Economic Community illustrate this process extending simultaneously beyond the boundaries of industries and nations. The key point is that the imposition of formal boundaries at any level of analysis typically does not limit the entrepreneurial ingenuity of brokers (representing networks of any size) who believe it would be profitable to span those boundaries. Therefore, it may be helpful to adopt theoretical perspectives which are not unduly constrained by such boundaries.

Theoretical Overlap Among the Types of Collectives

A Venn diagram illustrates the overlap in the definitions of cognitive communities, strategic groups, and networks of interdependent firms (See Figure 1). The three criteria used in definitions are (a) interdependence and interaction, (b) similarity of cognitive structures (goals and beliefs associated with attaining those goals), and (c) similarity of assets.

 Insert Figure 1 about here.

The definition of networks is the easiest to diagram at this point, as there is only one version of it and only one criterion--interactions among interdependent actors (e.g., managers, firms). Sets of interdependent, interacting firms would fall into sections A, C, D, or G in Figure 1. While a time dimension is not included, it may be useful to add a time based constraint for research purposes to avoid the noise of transient relationships. That is, analyses could be confined to networks that obtain a reasonably robust bounded equilibrium. Of course, what constitutes "reasonably robust" is inherently a judgement call, and should be determined by the specific needs of the study.

For cognitive communities, two definitions have been proposed. The weak definition only requires the managers (acting as brokers for the firms) to have similar cognitive structures. Sets of

firms that satisfy this definition would fall in section A, B, D, or E. In addition to having similar beliefs and goals, the strong definition requires that the members of a cognitive community interact. This emphasizes the social aspect of social cognition research. The intersection of the two criteria covers sets of firms in sections A and D.

For strategic groups, the weak definition merely requires similar asset configurations (sections A, B, C, and F). The semi-strong definition of strategic groups adds the constraint of similarity of goals and beliefs (cognitive structures). Due to this additional constraint, only sets of firms falling in sections A or B would be considered strategic groups. The strong definition of strategic groups stipulates that all three criteria must be satisfied: (a) similar assets, (b) similar goals and beliefs, and (c) interdependence and interaction. Only sets of firms in section A would fit that definition.

Note that the degree of overlap among these constructs is highest when using the strong definitions and lowest when using the weak definitions. For instance, the set of firms fitting the strong definition of a strategic group would be a subset of those fitting the strong definition of a cognitive community. When the weak definitions are used there would be a larger proportion of strategic groups that would not be considered cognitive communities, and vice versa.

There are at least two meaningful ways to use the definitions of these constructs. Researchers could select a definition (weak, semi-strong, or strong) that is appropriate for a given research question, and then use that definition to select a sample of firms for a study. Alternatively, researchers could start with a particular sample of firms (e.g., the US automobile industry), and then determine which level of each definition is satisfied in that sample.

Regardless of whether researchers select the definitions first and the sample second or vice versa, it is crucial that the definitions used when developing hypotheses are identical to those used when operationalizing the constructs. It is likely that hypotheses generated using strong definitions will not be supported if the measures used to operationalize the constructs only satisfy the weak definitions. Similarly, hypotheses based on strong definitions probably will not be supported if a preselected sample only satisfy the weak definitions (regardless of the measures used).

The lack of correspondence between operationalizations and theoretical constructs alludes to the introduction of bias when interpreting patterns of data and translating empirical findings to successively higher levels of abstraction. The impetus behind the efficiency-effectiveness heuristic proposed for synthesizing related bodies of knowledge is this dubious correspondence between information at different levels of abstraction. Certainly, the introduction of such bias is unavoidable. However, when conflicts at high levels of abstraction appear to be unresolvable, a reexamination of empirical findings (i.e. what is actually measured) may suggest a way forward.

Empirical Studies Linking the Theoretical Constructs

In the preceding section, it is argued that cognitive communities, strategic groups, and networks of interacting firms are related constructs. However, at this point, they are related by definition only. While the strong definitions of cognitive communities and strategic groups are more eclectic than the weak definitions, it is not clear *a priori* how the three criteria used to operationalize the constructs will interact. What factors influence the degree of convergence/divergence of criteria? The degree of convergence/divergence has implications for the evolution of collectives within industries. Findings from a series of empirical studies are used to go beyond the initial theoretical integration and flesh out an understanding of the formation and nature of collectives of firms within industries.

Thomas, Porac, and colleagues have conducted a series of studies of collectives in a variety of industries. These include a highly turbulent emergent industry (the computer software industry), a mature industry that is undergoing very gradual changes (the retail grocery industry), and a mature industry that has been extremely stable over time (the Scottish knitwear industry). The three industries provide an ordered set for study. The software industry marks one extreme as it is continuously changing. The knitwear industry marks the opposite extreme as it has changed very little over the years. The grocery retail falls somewhere between those extremes.

US Software Industry

The software industry was selected to examine the nature of cognitive communities under conditions of extreme ambiguity. There are a large number of partially overlapping, yet diverse niches. Hence, it is unclear which economic forces are most critical for a given firm. Further, rapid technological change creates considerable ambiguity regarding changes over time.

In a study of twenty software-development start-ups, cognitive orientations and pervasive social networking were found to be critical in the start-up process (Levenhagen and Thomas, 1990). Due to the continuous changes in this industry, there is little chance of any particular perspective being repeated often enough to be established and spread as a shared industry recipe. "Entrepreneurs in those markets seem intent on creating rules to new competitive games by intuitively trying to create new product categories, new kinds of firms, and growth markets" (Thomas and Porac, 1991). The only shared beliefs reflected (a) the awareness of ambiguity and (b) the belief that the ambiguity creates opportunities.

Levenhagen's (1992) more recent research examines the degree of consensus throughout the value chain with respect to desirable product characteristics. Findings in networks of suppliers and buyers are consistent with previous findings across rivals: namely, there is little consensus on what the ideal software package in a particular niche should be like.

UK Grocery Retail Industry

The grocery retail industry is much more stable than the software industry. In a pilot study used to assess similarities and differences in views, six to ten managers were interviewed from each of three organizations representing a range of supermarket retail operations. Results revealed that cognitive taxonomies of rivals varied widely from firm to firm. Further, differences were found across managers within the firms. It was suggested that the taxonomies were richer in areas that the given manager was most familiar with. This familiarity effect was evidenced by more taxonomic levels, more categories at any given level, and richer lists of attributes associated with each category.

When managers make sense of a market, the resulting cognitive structures reflect the elements that the manager encounters most often and is most familiar with. While this certainly reflects a cognitive bias, the underlying cognitive heuristic seems relatively pragmatic.⁶ Cognitive structures are developed to fit the manager's personal needs in terms of decision-making and problem solving.

Two subsequent studies have been performed to compare a cognitive approach with a more conventional approach to industry and competitor analysis (e.g., Porter, 1980; McGee and Thomas, 1986). In the economics oriented study, Lewis and Thomas (1990) and Carroll, Lewis, and Thomas (1992) identified strategic groups in the industry and the competitive recipes that defined the groups. Annual data reflecting scale and scope dimensions of strategic choice were obtained from the largest 16 multiples (chains) over a seven year period.

In the cognition oriented study, questionnaires were administered to a large number of managers within two retail operations: a large multiple (chain) and a large coop.⁷ Questionnaires assessed each manager's views about career issues, who they viewed as competitors, the attributes of those competitors, and the competitive structure of the industry.

The results from the cognitive data were similar to those from the economic analyses with respect to the key strategic dimensions. Multi-dimensional scaling of the cognitive data indicated that there were three key dimensions in this industry: store size, geographic coverage, and price/proportion of own-label lines. These dimensions reflect the economies of scale and scope noted in the economic analysis of the industry.

In addition to identifying key strategic dimensions, the results of the multi-dimensional scaling procedure were used to plot the firms in the cognitive representation of the strategic space. This plot was compared to the strategic groups identified using a cluster analysis on the economics

⁶Presumably, an unbiased structuring would reflect the industry in its entirety with uniform richness throughout, but this assumes that industries are clearly bounded. This is arguably not the case as most industries are better described as fuzzy sets than as discrete units (Porter, 1980).

⁷The identity of these firms are withheld to honor guarantees of confidentiality.

oriented data set. While the groupings from the two methods were not identical, many of the firms were consistently grouped together.

Scottish Knitwear Industry

A third set of studies was conducted on the Scottish knitwear industry which exemplifies stability. "This particular group of firms was thought to be an ideal case for studying the influence of shared beliefs and competitive recipes given its small size, cultural homogeneity, geographical characteristics, and long-standing traditions" (Thomas and Porac, 1991).

A pilot study (Porac, Thomas, and Baden-Fuller, 1989) with top managers from approximately 20 firms replicated findings from the grocery retail study. The richness of taxonomies reflected a given manager's demands for cognitive processing, and the set of competitors consisted of firms in the same taxonomic level as the manager's firm. Notably, these managers only listed other Scottish firms as their rivals; Italian producers were perceived as being in different businesses.

In a larger study, questionnaires were sent to 260 firms; 89 usable questionnaires were returned. A cluster analysis was performed on an array strategic variables reflecting each firm's choices regarding raw materials, production methods, distribution channels, and end consumer. Thus, the resulting strategic groups were based on inputs, throughputs, and outputs.

If firms are geographically close together and have similar inputs, throughputs, and outputs, then the firms will probably compete for suppliers, workers, equipment, buyers, etc. Network analysis revealed that the densities of both cooperative and competitive ties were higher within the groups than between them. That is, firms are more likely to be perceived as rivals and/or allies if they are in the same economically based strategic group than if they are in different groups. The differences in the density of interactions within groups versus between groups were very consistent in this sample. Network analysis (PARTEST in the UCINET package) was used to compare the patterns of competition and cooperation within and between strategic group. For all 89 firm (100% of the sample), the average cooperation/competition with firms in the same group

was greater than or equal to the average cooperation/competition with all other firms. Hence, based on this criteria, the network analysis of cooperation and competition was able to predict which strategic group each firm belonged to with perfect accuracy.

In comparing lists of rivals and allies provided by the managers, it was found that the sets were not mutually exclusive. In fact, the overlap was fairly strong ($r = +.32$). This suggests that cooperative and competitive interactions are not diametrically opposed. These actions may be better thought of as tools in a repertoire of behaviors that firms use to manage economic interdependence (e.g., to discipline mavericks within an oligopoly).

To determine if the members of each group had a shared sense of identity, each manager was asked to rate a number of terms to indicate which terms best describe his firm. A MANOVA was performed using strategic group membership as the independent variable and descriptiveness ratings as the dependent variables. The significant results indicated that there was greater variance between strategic groups than within them in terms of how managers label their firms. Scheffé tests suggested that these differences followed fairly simple patterns reflecting relatively discrete categories. This suggests that the members of these strategic groups have some consensus on the type of firms they are.

Findings suggest that managers do perceive distinct groups of interdependent, interacting firms in the Scottish knitwear industry. Different groups use slight variations on a common recipe. Still, an industry recipe seems to exist within the greater cognitive community (Scottish knitwear producers). The strategic groups are part of the same superordinate category (i.e., Scottish knitwear) while other producers (e.g., Benetton) fall into other categories (e.g., Italian knitwear) at that superordinate level.

As noted earlier in this section, the similarity in this shared set of beliefs at the strategic group level, and to a lesser extent at the industry level, is probably due to the small size, cultural homogeneity, geographical characteristics, and long-standing traditions. The remarkable stability in this industry may be due to the fact that it has been virtually a closed system. There have been

vary few avenues through which novel ideas could enter, and the bounded equilibrium in that segment of the value chain has been robust and highly resistant to change.

Interpretation of Empirical Findings

The empirical findings reveal a convergence of the cognitive, organizational, and economic criteria in the two stable industries (grocery retail and knitwear). Given that the criteria were operationalized using different methods and different types of data, it is unlikely that the collectives identified by these criteria are simply statistical artifacts. This lends support for the construct validity of these forms of collectives (Cook and Campbell, 1979).

It would be inappropriate to conclude that this degree of convergence across methods negates the need for pluralistic research. The degree of convergence among these theoretical perspectives is not as high in every situation as it was in the Scottish knitwear industry. Studies in turbulent industries such as computer software development suggest that perceptions, industry structure, and patterns of interactions may show very little overlap. It is conceivable that the measure of cognitive similarity was a poor operationalization for the construct. However, this explanation does not seem plausible given that the method replicated that used in a number of studies in the other two industries.

A more plausible explanation is that the relationships among the economic, psychological, organizational factors may be moderated by some other factor(s). For example, the degree of ambiguity in an industry could influence the accuracy of managerial perceptions. In ambiguous, rapidly changing environments, the initial (mis)perceptions of managers drive subsequent social enactment processes. In the absence of industry-wide consensus, many socially constructed networks have little systematic impact on the structure of the industry while a select few may cause Schumpeterian revolutions. In such revolutions, the economic reality would come in line with the perceptions of members of the innovating cognitive community (i.e., those enacting their shared vision). Consequently, there would be close agreement between economic, cognitive, and organizational measures within that particular cognitive community. For the rest of the industry,

however, there would be increased discrepancies between perceptions and economic realities. Generally, it will take some time for the victims of the Schumpeterian shock to recognize the change and interpret it, let alone respond to it. Hence, time may be a key strategic dimension, and dynamic modelling may be necessary to understand the nature of competition in turbulent, ambiguous environments. Psychological, organizational, and economic factors may be traced over time, and the interaction of these factors may significantly improve predictions of industry dynamics.

Figure 2 sketches the loose coupling of insights from psychological, organizational, and economic streams of research. A cycle of reciprocal causation is proposed in this theoretical framework. Economic factors (industry structure) influence psychological factors (the perceptions of economic incentives). Related cognitive processes within individuals drive organizational processes among individuals (group decision-making within top management teams) which drive organizational processes among buyers, suppliers, and rivals (the social enactment of markets). The causal chain comes full circle as this social enactment process influences economic factors (industry structure). Some slippage may be induced in these causal links due to uncertainty and ambiguity arising from (a) imperfect information regarding the economic forces currently operating in a particular niche, and (b) an inability to forecast the the future structure of the industry due to the threat of technological or regulatory changes.⁸

Insert Figure 2 about here.

There appears to be a growing population of managers confronted by a world that is rapidly changing. These are the practitioners that are perhaps in greatest need of (most receptive to) guidance from business scholars. Notably, it is unlikely that any single perspective would

⁸It is reasonable to assume that there may be variables other than ambiguity that mediate or moderate the interactions among psychological, organizational, and economic factors. It would be prudent to continue this stream of research in a wider range of industries and across a wider range of phenomena to develop a richer understanding of these interactions.

sufficiently explain critical events under these circumstances, and the bits of unique information generated by the perspectives may be very difficult to integrate. The key to putting the pieces of the puzzle together may involve the interaction effects among variables that have traditionally been considered separately by the various disciplines.

In the absence of relatively holistic theories it may be difficult to explain why economically irrational patterns evolve and persist. For instance, it appears that the Scottish knitwear industry as a whole is threatened by the Italian knitwear industry just as the US automotive industry was threatened by the Japanese producers (Thomas and Porac, 1991). However, the cognitive taxonomies of the managers in the Scottish knitwear suggest that those managers do not view the Italians as direct competitors.

There seems to be a consensus in the industry that strategies that have worked in the past will continue to work in the future. These beliefs seem to persist despite the recent formation of cooperative alliances and the adoption of collective strategies among Italian producers. Until the economic threat is perceived by managers (psychological factors), it is unlikely that the Scottish managers, acting as brokers for their firms, will systematically modifying their existing patterns of interactions with suppliers, designers, distributors, etc. (organizational factors) in order to expand into other geographic and product markets, erect entry barriers, etc. (economic factors).

If Italian collectives can capture a significant portion of the market share from the Scottish firms (i.e., break into existing networks of transactions with buyers), then rents within the Scottish knitwear industry may drop below satisfactory levels. This would motivate managers to identify the problem (gap analysis) and change the way they approach transactions. This may bring about an end to the bounded equilibrium that has existed in the Scottish knitwear industry and give rise to dramatic changes in the nature of competition.

In addition to predicting responses to change in (traditionally) stable industries, holistic theories may shed some light on industry dynamics in continuously turbulent industries such as the US computer software industry. As technology based competition becomes more prevalent, the need for more comprehensive theories becomes harder to ignore. It would seem that contemporary

issues in strategic management demand more holistic perspectives than are currently offered by more narrowly defined fields, and strategic management research provides the most obvious forum for a renaissance in theory development.

A Heuristic Approach to Holistic Theory Development

As a field, strategic management is inherently interdisciplinary in that the phenomena of interest transcend the boundaries of previously existing fields of research. Strategic management lies at the nexus of a diverse set of fields: cognitive and social psychology, organizational behavior, organizational theory, and industrial organizational economics, to name a few. The accumulated bodies of knowledge associated with these fields are quite large. As such, it may be more efficient in general to use information at higher levels of abstraction (e.g., theories) in the integration process. Unfortunately, differences along two dimensions (the unit of analysis and the nature of the phenomena) seem to motivate the use of different, often conflicting, sets of theoretical assumptions. The intersection of logical propositions (i.e., common ground) in these fields rapidly shrinks as more perspectives are simultaneously considered. This makes it difficult to integrate these fields using deductive logic on the intersection of theoretical premises.

This reflects the trade-off between efficiency and effectiveness when operating on accumulated bodies of knowledge at various levels of abstraction (discussed in the introduction section of this paper). A reasonable heuristic for managing this trade-off is to use high level abstractions when ever possible, and move toward more concrete levels (empirical findings) when conflicts at more abstract levels can not be resolved. Inductive logic may be used to develop new (more holistic) theories based on existing bodies of empirical findings and new empirical findings focussing on the interaction of factors associated with the different fields.

An inescapable flaw of inductive logic is that it may introduce new sources of bias. With this in mind, a high level abstraction is needed to guide the synthesis process, thereby minimizing the risk of internal inconsistencies (i.e., contradictions among biases). Given the scope of the problem, a parsimonious structure seems advisable. A reasonable structure for the union of the

fields would be to use the two dimensions that emerge when juxtaposing the fields: the level of analysis and the nature of the phenomena studied. The levels of analysis that will be considered are relatively straightforward: individuals, dyads of individuals, collectives of individuals (e.g., firms), dyads of firms, and collectives of firms. The nature of phenomena (knowledge-, affiliation-, and resource-related) is described using a taxonomy inspired by Foa and Foa's (1975) circumplex of currencies of social exchange and French and Raven's (1959) sources of power.

French and Raven (1959) proposed six types of power sources: informational, expert, reward, coercive, referent, and legitimate. Foa and Foa (1975) developed a circumplex categorizing the currencies of social exchange: love, status, information, money, goods, and services. These taxonomies are merged and collapsed into three broad currencies of exchange and sources of power: knowledge, affiliations, and resources. Knowledge-related phenomena are associated with French and Raven's informational power and expert power, as well as the Foa and Foa dimension of information. Affiliation-related phenomena are associated with French and Raven's concept of referent power and Foa and Foa's dimensions of love and status. The resource-related phenomena are associated with a catch-all category that subsumes legitimate, coercive, and reward power from the French and Raven model and money, goods, and services from the Foa and Foa circumplex. These two dimensions (the unit of analysis and the nature of the phenomena) provide a parsimonious structure for organizing the knowledge accumulated in fields related to strategic management.

The scope of the framework is ambitious, yet it is not without precedent. Indeed, many of the overarching ideas have been circulating for over three decades. March and Simon's (1958) behavioral view of the firm addresses the knowledge- and affiliation-related aspects with some mention of resource-related issues. Penrose's (1959) resource-based view of the firm focuses on the interplay between resource- and affiliation-related aspects with some mention of knowledge-related issues. Williamson's (1975) transaction cost theory places the heaviest emphasis on affiliation-related issues while addressing some knowledge- and resource-related issues. While these three theoretical frameworks differ in their relative emphasis on types of phenomena, they all

take a bottom-up approach by starting with assumptions about small units of analysis (individuals, resources, transactions) and deriving implications for larger units (firms, industries, value chains). On a continuum ranging from basic-research to applied-research, March and Simon's and Penrose's frameworks seem to lean toward basic research while Williamson's framework has more of an applied flavor to it. Figure 3 illustrates a bottom-up approach and the placement of some relevant issues within the proposed two dimensional framework.

Porter's (1980) approach to competitive strategy frames the debate in a top-down fashion with a much stronger emphasis on applied-research. Porter focuses on generating likely scenarios for industry dynamics. With this goal in mind, he argues that economically rational strategies should be based on the anticipated actions of other firms. Hence, strategists should consider the political processes within each firm and even the cognitive and emotional processes of each decision maker in the firms. Figure 4 illustrates some of the primary concerns of the top-down approach.

 Insert Figures 3 and 4 about here.

Figure 4 is a macro (collective) representation of the micro (dyadic) relationships among firms illustrated in Figure 3. Moving between Figures 3 and 4 is analogous to moving closer to or further from a painting by Van Gogh. The perceptions of the painting may change as one's attention is drawn to either the short line segments or the larger images formed by those brush strokes. The perspective alters the perception, but the painting remains the same. In research, moving from one unit of analysis to another may change the patterns that are noticed in a body of data, but it does not change the underlying phenomena. Dyadic interactions among firms flow together to form cognitive communities, strategic groups, even value chains. Concepts from network analysis are being used to span these units of analysis and examine these macro level patterns.

The framework proposed in this paper has been greatly influenced by both the bottom-up and top-down approaches of the existing broad-scope theoretical frameworks. The proposed two-dimensional framework reflects an attempt to dove-tail the "push" of basic research and the "pull" of applied research. So, while the two dimensional framework offer a novel way of structuring information, it is important to note that the overarching ideas were proposed a long time ago by some of the giants of theory development. There is no attempt to take the credit for inventing the wheel. The proposed framework merely attempts to put axles between existing wheels to develop vehicles for future research.

The two dimensional framework also facilitates the inclusion of more recent theoretical developments. The framework acts as a peg-board that can be used to tack on narrower theories that address more specific issues. For example, sophisticated models of social cognition (e.g., Wyer and Srull, 1989) may be used to augment the understanding of how managers perceive their environment and manipulate relevant information. Finance models may be used to enhance the valuation of currently held resources, the discounted value of (potential) future outcomes, the value of maintaining various options, and so on. Implications from resource dependence (Pfeffer and Salancik, 1978) may enhance the understanding of power relationships among firms. This peg-board approach reduces the risk of overlooking relevant information as the synthesis process pushes for a deeper understanding within each area of the framework.

As noted earlier in this section, Figures 3 and 4 serve as blueprints for theory construction. They help maintain a holistic mind-set and minimize the risk of internal inconsistencies within the framework. This is reminiscent of a slogan used by some activists: "Think globally, act locally."

The intuition behind synthesizing information is analogous to that used when sewing a quilt. Keeping the overall design in mind makes it easier to see how the sections need to be pieced together. This helps to avoid wasting efforts on nonessential connections. If large pieces dove-tail together, the process can move along quickly. If partially overlapping pieces can not be neatly combined, each piece may be unravelled, and the threads may be woven into a new piece designed to cover the area. It is not necessary to directly link every possible permutation of edges together

as long as the network of connections provides an overall coherence (i.e., no internal inconsistencies).

In initial attempts at theory development it is assumed that the environment is unambiguous and information flows relatively freely. This simplifying assumption makes it easier to extrapolate interactions among types of phenomena from one level of analysis to another. To make models applicable to more real world situations, the assumption may be relaxed, and the effects of ambiguity are tracked through the framework.

Developing Analytic Models within the Theoretical Framework

After developing a viable blueprint, the push for greater depth of understanding is important if this synthesis of knowledge from related fields is to be of much use to practitioners. Frameworks of this scope are often useful for framing research questions, but often they are too abstract or vague to generate specific predictions or recommendations.

Current research includes efforts to develop a mathematical model and an artificial intelligence model (Carroll, 1991). Both of these models are designed to predict interactions among firms (industry dynamics). While being drawn toward economically rational patterns, the models attempt to simulate distortions due to cognitive biases and emotional reactions and to predispose individuals to various forms of political activities within the firm (e.g., coalition formation, political infighting). This takes a game-theoretic approach to modeling industry dynamics given (a) the initial distributions of individuals' beliefs and power and (b) the structure of the networks connecting those individuals. A nice feature of these models is that the input may be based on theoretical assumptions or empirical data (e.g., responses to questionnaires, archival data).

Relative to natural languages, analytical models provide a more precise means of expressing ideas. A primary goal of developing these analytic models is to identify implicit assumptions that may be overlooked in the theoretical framework. Unlike theorists, computers don't make implicit assumptions. Assumptions must be explicitly stated in the program, or the

models will not function as expected. This offers an invaluable method of tightening up a set of logical arguments.

Further, due to the complexity and scope of the theoretical framework, it is likely that the limits of human cognition will be exceeded when tracing implications through the framework. These analytic models are being developed as tools for pushing a set of assumptions to their logical conclusion. As such, these analytical models may be better thought of as a means (rather than ends) of critical thinking (Jasany, 1989; Thomas, 1988, 1990; Carroll, Pandian, and Thomas, forthcoming).

From a practitioner's perspective, models developed from this proposed framework may be useful in predicting when and how a firm's actions will deviate from economic rationality. If the models can predict such deviations, they could improve the accuracy of competitor response profiles. These, in turn, could improve the accuracy of the scenario analyses and the effectiveness of strategy formulation based on those scenarios. Ultimately, this could mean improved performance for the firm.

Conclusion

Relative to managers in stable industries, managers immersed in ambiguous environments may perceive a greater need for insights from strategic management research. Ironically, while this ambiguity may create demand for theories, it also creates the conditions under which the theoretical perspectives currently used in strategic management provide the least comprehensive and most divergent sets of results. If interactions among psychological, organizational, and economic forces are overlooked, it may be impossible to integrate the divergent findings. Consequently, general managers may be hard pressed to develop a comprehensive strategy based on reports submitted from a variety of departments by analysts trained in different areas.

This does not imply that the theories and methods within a specific field are incapable of answering the questions relevant to that field. Nor does it imply that the questions asked in narrower fields are of no interest in strategic management. The point that is strongly implied is that

the need for holistic theory development falls squarely in the domain of strategic management, and solutions can not be borrowed from narrower fields.

Strategic management has traditionally emphasized applied research and borrowed theories from a variety of fields that have emphasized basic research. The relationship between strategy and economics has been compared to the relationship between engineering and physics. While practitioners may benefit from such an orientation, there is very little value added for researchers if a multilectic approach merely applies several perspectives without building on the insights gained from juxtaposing them. This may do a serious disservice to the field by ignoring the opportunity for interdisciplinary theory development.

Perhaps another metaphor could be found that would suggest the potential value added by strategic management research. I-O economics could be likened to Newtonian physics in that it studies certain forces impinging on an object (e.g., an organization, and industry). Organizational behavior and organizational theory could be likened to chemical engineering in that they focus on the properties of the objects or the medium being acted upon (e.g., an organization, an industry), and they often endeavor to redesign or create novel forms with more desirable properties. Strategic management could be likened to fluid dynamics: the medium and the forces acting upon/within it are inherently intertwined and cannot be meaningfully separated. This reflects the inseparability of the content and process sides of strategic management (e.g., formulation and implementation).

So, while economic incentives may be the best single predictor of business transactions, people negotiate the deals and make the decisions. While conduct within a market may be drawn toward economic rationality, cognitive and social forces may produce friction inhibiting the movement toward economically rational patterns. These forces may even drive the patterns in economically irrational directions. Metaphorically, an organization or institution (e.g., an industry) is like a viscous medium that generally flows in a predictable direction (i.e., toward economic rationality), but due to the nature of the medium, it is predisposed to the formation of eddies and backwashes which temporarily impede and even reverse this flow in some niches.

While boundary spanning fields such as fluid dynamics and strategic management build on empirical findings and theoretical developments in narrower fields, the research questions asked in boundary spanning fields can not be completely addressed using the theoretical frameworks from any one of the narrower fields taken in isolation. More holistic frameworks are needed to address the phenomena of interest within boundary spanning fields.

When viewing strategic management phenomena (e.g., collectives of firms within industries) from more than one perspective, the perspectives often offer some common (overlapping) insights and some unique insights. These perspectives can be combined "additively" by considering them one-at-a-time. This would be analogous to facing out over a garden and alternating between looking with one's left eye and then one's right eye (monocular vision). By combining one-eyed perspectives, it is possible to see a wider range of the garden. However, by looking through both eyes simultaneously (binocular vision) the interaction of the perspectives generates cues for depth perception that are otherwise missing.

A holistic approach to strategic management offers more than just a wider view of a given phenomenon. It creates opportunities to see new dimensions. This is illustrated by the serendipitous observation that ambiguity may play a moderating role in the evolution of collectives within industries. Hence, a meaningful goal for this stream of research would be to work toward a relatively holistic theoretical framework that subsumes existing theories by addressing the union of the phenomena studied (Feyerabend, 1970). Insights from philosophy of science suggest that such a journey may be a worthwhile even if the ultimate destination is far away and perhaps unreachable.

The development of holistic frameworks could nurture a renaissance in strategic management in that a rebirth of theoretical developments may arise from the marriage of accumulated knowledge from diverse fields. As more comprehensive theories are developed, it is likely that the methods associated with narrower theories will have to be modified to provide adequate tests of broader hypotheses. Such theoretical and methodological development might be described as the emergence of a new paradigm in a relatively young field (strategic management),

rather than a paradigm shift in any of the older, more focused fields (Kuhn, 1962). A renaissance in theory development may be fueled by an accumulation of new questions, rather than an accumulation of aberrant findings associated with existing paradigms. As the nature of research questions in these fields diverge, so to will the evolutionary paths of their paradigms.

It is important to recognize that discussions of paradigm shifts are implicitly discussions of social enactment processes within an academic community. The suggestion that there may be other ways of doing things often raises red flags with established researchers who have made, and continue to make, invaluable contributions to the field. In no way does this paper suggest that holistic theory development is the only way to advance the field. There appear to be a number of viable "strategic groups" of researchers in this field. This paper is intended to highlight the potential rents to be gained from interdisciplinary theory development and suggest that the field as a whole may benefit from the existence of a "strategic group" that focuses on the research needs that are unique to strategic management.

Empirical findings suggest that different theoretical perspectives provide a greater amount of non-redundant information as the degree of ambiguity increases. The rapid changes coursing through the business world have generated a great deal of ambiguity for managers. These (presumably) temporary conditions suggests an acute need for an academic renaissance. The emergence of high tech fields characterized by continuously technological change suggests that there may be a chronic need for such theories. In other words, there is a pronounced short term demand and a projected long term demand for holistic theories. Academicians should be sensitive to this market pull for theory development even if it seems at odds with traditional views of strategic management.

In a traditionally practitioner-oriented field such as strategic management, development of integrative theories could provide a more holistic view of firms and industries. More to the point, it could improve techniques for forecasting industry dynamics, thereby improving the effectiveness of practitioners in developing competitive strategies. Ironically, the field's contribution to

practitioners would be unnecessarily constrained by fostering the belief that strategic management should focus on applying theories, rather than developing them.

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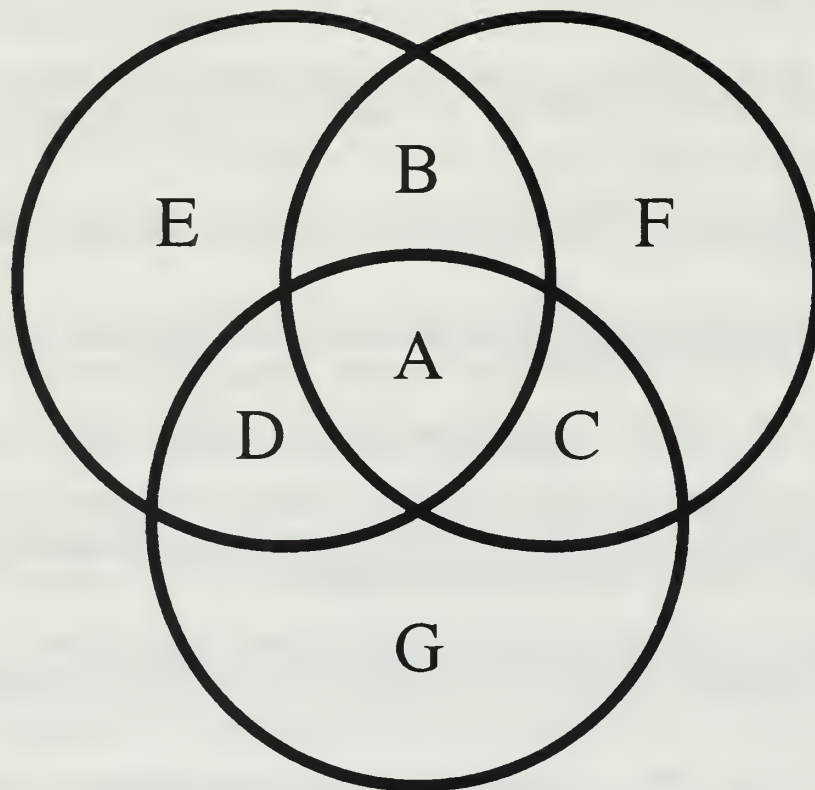
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**SIMILAR
COGNITIVE
STRUCTURES**

**SIMILAR
ASSETS AND
POSITIONING**



**INTERDEPENDENCE
AND INTERACTION**

Figure 1. Venn Diagram Reflecting Overlapping Sets of Firms that Would be Encompassed by Using Various Combinations of Criteria

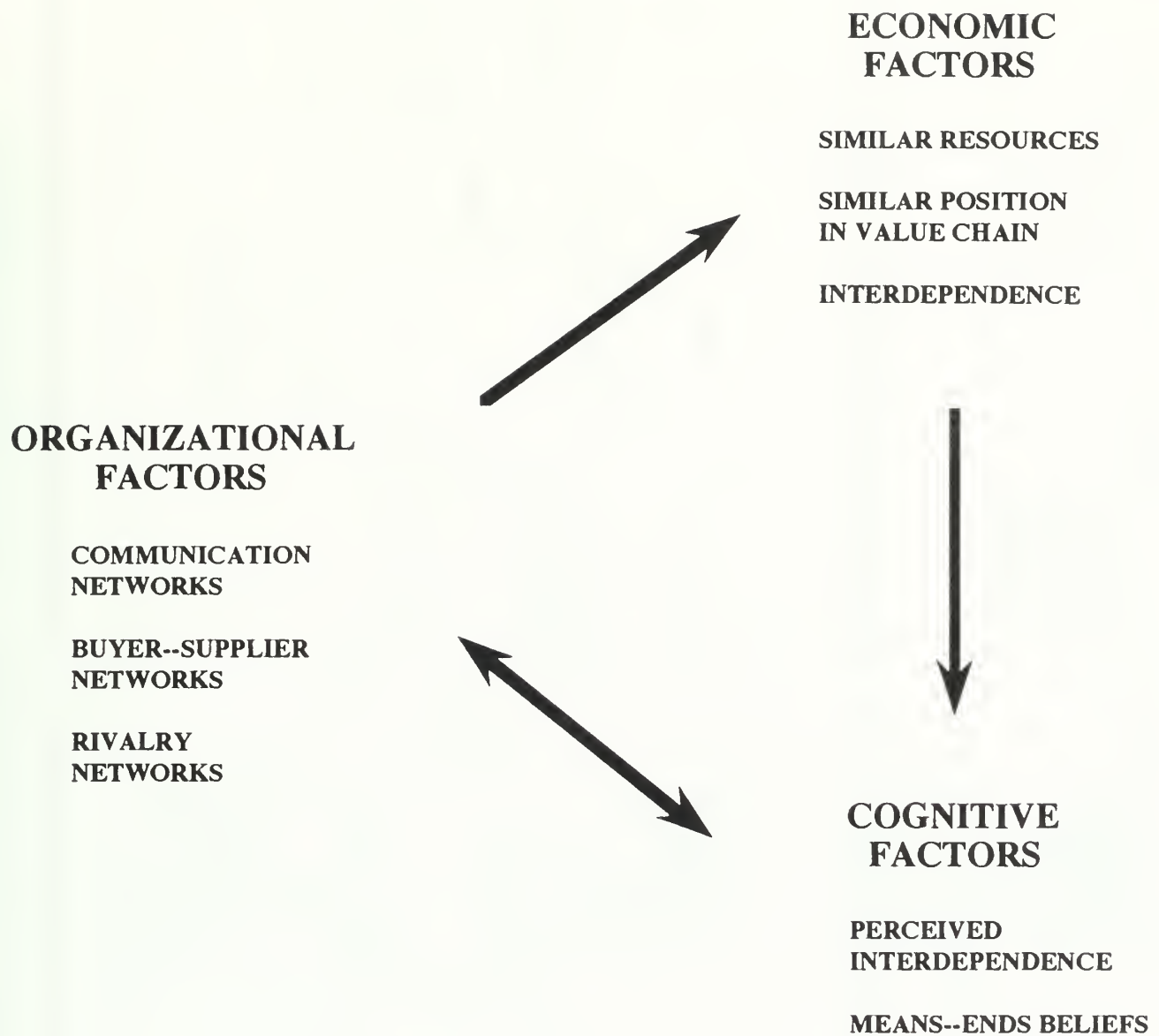


Figure 2. Cyclical Patterns of Causal Links Between Various Cognitive, Organizational, and Economic Factors.

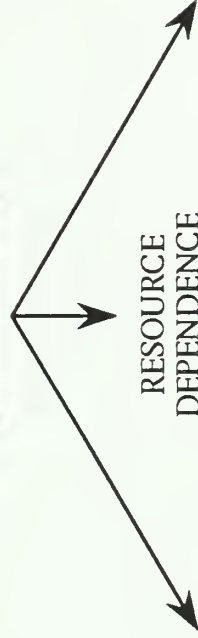
KNOWLEDGE RELATED

COGNITIVE COMMUNITIES



RESOURCE RELATED

SUPPLIERS



RIVALS

STRATEGIC
GROUPS
GEOGRAPHIC
SPATIAL
COMPETITION

PRODUCT
SPATIAL
COMPETITION

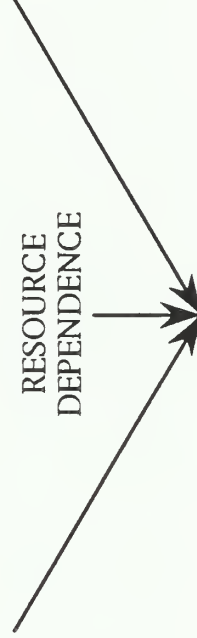
ELASTICITY

POTENTIAL ENTRANTS

MOBILITY
BARRIERS

SUBSTITUTES

BUYERS



MARKET
SEGMENTS

UPSTREAM

VALUE CHAIN

DOWNSTREAM

Figure 4. Collectives of firms that emerge from patterns of vertical (supplier/buyer) and horizontal (rival, substitute, potential entrant) ties among dyads of firms (see Figure 3).

